

SPECIFICATION

(SECOND PARAGRAPH, PAGE 3, LINES 5 AND 6 FROM THE TOP OF PARAGRAPH)

The basic concept suggested in the '067 patent of electrical energy as an element of a stunning or disabling force to be delivered by a weapon re-emerged with significant effectiveness in what is known as Taser technology. The Taser is a hand-held, self-defense device that supplies a stunning electrical charge and the a projectile that remains connected to the device. The electrical charge is delivered to the target by electrodes positioned in the projectile. The effective range of the Taser is limited to 4.5 - 6.7m (about 12 - 15ft). In addition the device or weapon is limited to a single shot because the projectile must remain wired to the power-source weapon. The basic power supply for the remote system is described in U.S. Patent No. 4,253,132 issued February 24, 1981 to Cover, and details of the power providing device and projectile firing weapon are described in U.S. Patent No. 3,803,463 issued April 7, 1974 to Cover.

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The physiological fact that an electrical shock delivered in two bands, one causing pain and the other inducing paralysis of the nervous system is not recognized by the '816 patent, the '806 patent, or by the Taser technology. The fact that penetrating the skin allows effective use of significantly lower voltage to induce the stunning effects is not recognized.

(FIRST PARAGRAPH PAGE 5 LINE 6 FROM TOP OF PARAGRAPH)

A variety of non-lethal projectiles has been described. Many are well known to the military, to law enforcement agencies, and even to the public. They include devices such as rubber and relative soft synthetic bullets to be fired from standard fire arms, and bean bags (or soft, flexible containers of solid loosely packed pellets) adapted to be discharged generally from smooth bore weapons.

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AND 8 FROM BOTTOM OF PARAGRAPH, PAGE 8)

These and other goals of the invention are achieved by a wireless projectile that includes a circuit capable of receiving and holding or storing an electrical charge from an external source and further capable of generating and delivering a shock from the 15 stored electrical charge and also by a wireless projectile that in addition includes a housing or body in which the circuit is positioned, with shock delivering electrodes extending from the front of the body, and the projectile further being adapted to 20 being fired from various types of weapons using explosives or gas pressure as a propellant, or being thrown by hand, and in addition, the body having structures such as fins and ridges that serve as ripples to stabilize the projectile in flight. Moreover, these and other goals are further achieved by an electric circuit adapted 25 for charging by an external power source and having two oscillators, each connected to the power source for charging and

specific power output connections, and further a capacitor capable of being charged and capable of outputting its stored charge, plus a timing circuit and analog switch that controls power flow, and in addition controller and amplifier elements with power input and output capabilities and being connected to at least one oscillator and further being functionally connected to the analog switch; in addition a proximity sensor is functionally connected to the timing switch and to members of at least one pair of electrodes, with the ground electrode connected to proximity sensor and the other electrode connected through the analog switch. These and other goals of the invention are further achieved by a sub-lethal, wireless projectile with an electrical power storage element that is charged from an external power supply and that includes a circuit system that regulates the delivery the magnitude and frequency of pulsating shocks that are delivered to a target individual by means of electrodes that can penetrate clothing and penetrate the skin of the target individual with the entire electrical system positioned in a cylindrical body or cartridge with the electrodes extending from its tip and, in addition to the delivery of the shock, the cartridge delivers a physical blow to the target individual on contact. The goals of the invention are still further achieved by a cartridge that includes a propellant and primer so that the cartridge can be discharged by a weapon thereby launching a sublethal projectile positioned in the cartridge. In addition, the goals of the invention are further achieved by a device that holds the ~~holds~~ sub-lethal projectiles

positioned in cartridges so that they can be connected to and charged by an external power source.

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5 BOTTOM PAGE 14)

Figure 1 illustrates the shock delivery circuit 101 and comprises at least nine basic components. The external basic DC power source 102 capable of supplying a power potential of from 3 to 15 DC volts powers the circuit but is physically separated from it and therefore not considered to be part of the circuit as the circuit ultimately functions in a wireless projectile; (1) a first oscillator 103 capable of creating a frequency of from 15 to 50 Hz; (2) a second oscillator 104 capable of creating a frequency of from 250 to 500 kHz; (3) a capacitor 105 capable of storing and discharging electrical energy to provide three or more discharges of eight or more seconds delivering a pulsating shock of from 5 to 30 watts with non-discharge periods of up to 3 seconds between the discharges; (4) a control and amplifying unit 106 capable of combining the frequencies delivered by the first oscillator 103 and the second oscillator 104 and of stepping-up the potential of the electrical energy delivered initially by the basic DC power source 102 to 100 to 400 volts. In an alternate configuration, the potential step-up function of the control and amplifier unit 106 may be assumed by an independent transformer electrically positioned between the basic DC power source 102 and a point 112 at which the input electrical conductor 111A is connected to the

circuit 101; (5) a timing circuit 107 capable of regulating both the pulse rate of discharges between 2 and 45 pulses per second and the duration of discharges, between 5 and 15 seconds; (6) an analog switch 108 capable of regulating the flow of current to a first electrode 109A; (7) a proximity sensor 110 that maintains the system in an inactive (no current flow) when open, ~~or and is~~ capable of closing and thereby allowing current flow when the first electrode 109A and the second electrode 109B are in close proximity or contact with the skin of a target individual; (8) a common ground for the entire circuit 111B; and (9) a rapidly detachable jack connecting the basic DC power source 102 to the circuit 101 at a point 112. Depending on the means used to deliver the projectile 201 in which the circuit 101 is positioned, the point 112 and jack may be on the projectile or on a cartridge casing in electrical communication with the circuit 101. The perimeter or body of the wireless projectile 202 in which the circuit 101 is positioned is

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Figures 4A, 4B, and 4C combine to illustrate a device or modified weapon to launch a wireless projectile 410 from a fixed ground location so as to provide perimeter protection to a specific location or facility by use of a disabling electric shock to a target individual delivered by the projectile. A projectile for use in the weapon is also described. The basic weapon 401 comprises three major elements: an outer sleeve 402 with a solid

base 402A fixed to the sleeve; an inner sleeve 405 designed to move vertically within the outer sleeve and powered by pneumatic or mechanical means; a plurality of barrel elements 403A and 403B are removeably attached to the inner sleeve 405. Figure 4A illustrate 5 a device with only two barrel elements. The barrel elements may be attached by threads to the inner sleeve. The cross section shape and maximum dimension 404 of the barrel elements 403A and 403B are effectively the same as the shape and maximum dimensions of the wireless projectile 410 described by Figure 4B such that the 10 wireless projectile 410 when placed in the distal end 421 of a barrel element and the barrel element closed by with its cap 422 forms a nearly air tight seal with the barrel element. Each barrel element may be removed for loading with a projectile, or as an alternative, each barrel element may be loaded through its proximal 15 end. In this mode, the barrel may be permanently fixed to the inner sleeve, rather than threaded to it. A source of compressed gas 407 is connected to the cap 422 of each barrel element such that the gas can be released to propel the projectile from the barrel element. The entire device 401 is positioned in a small 20 silo 425 such that when the inner sleeve 405 is fully retracted into the outer sleeve 402 the entire device is at or slightly below the soil surface 426. A plurality of devices may be arrayed to protect a defined area, and the inner sleeve and connected barrel elements elevated remotely or in response to a remotely sensed 25

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The wireless projectile 410 of Figure 4B comprises a body 450, with an upper surface 416, a lower surface 417, a front edge or leading surface 418, a back surface 415, a thickness 419, a perimeter wall 414, and a maximum width 420. A plurality (three as illustrated) of barbed, probe-like elements 411A, 411B, and 411C are positioned along the front, or leading edge 418 of the body 450. The barbed, probe-like elements contact a target individual and penetrate the clothing and skin and physically serve to attach the wireless projectile 410 to the target individual. In addition a plurality of pairs of electrodes 412A/413A, 412B/413B, and 412C/413C also extend from the leading edge 418 of the projectile 410. Members of each pair of electrodes are electrically connected to and part of the electrical circuit 101 which is positioned in the core 450 of the body of the projectile. The electrodes are wired such that any two electrodes of opposite polarity that penetrate the skin will complete a circuit and thereby deliver the disabling electric shock generated by the electric circuit as described in Example 1. The body may be fabricated from any of a variety of materials, with preference given to plastic and hard rubber. The probe-like elements 411A, 411B, and 411C and all electrodes are made from conductive material that is stiff, but that can be reflexed, or bent backwards against the perimeter wall 414 and held in this position until the projectile is discharged from the barrel element at which time ~~the~~ they spring to ~~there~~ their normal, effective position.